

### **REMARKS**

This amendment is submitted in response to the Final Office Action mailed August 17, 2009. In view of the above claim amendments and the following remarks, reconsideration by the Examiner and allowance of the claims are respectfully requested.

This amendment follows the interview with the Examiner, which is gratefully acknowledged. Professor Thomas Nosker, one of the inventors, attended the interview and explained how the claimed beams had the load bearing properties of materials with rectangular cross sections, despite there being areas “carved out” from the rectangular cross-sections as defined by the dimensions of the web and flange sections.

Claim 1 has been amended to emphasize this distinction. That is, Claim 1 is amended to require not only the width of the flange sections measured perpendicular to the horizontal axis of the flange section to be is two to ten times the width of the web section measured perpendicular to the horizontal axis of the web section, but also to require that the vertical dimension (thickness) of the flange sections to be about one-tenth to about one-half the size of the vertical dimension of the web section without any flange sections. This merges Claim 4 with Claim 1 and also does not introduce new matter.

Claim 1 is also amended to clarify that the co-continuous immiscible polymer blend consists essentially of:

a high density polyolefin and  
a thermoplastic polymer-coated fiber material or a thermoplastic polymer having  
fiber material embedded therein.

Only the “consisting essentially of” language is new. Otherwise, limitations have been set off as independent paragraphs to make this part of the claim more readable. This also does not introduce new matter and better defines the materials responsible for the unexpected load bearing properties of the claimed structural members.

Claims 1-3, 6-8 and 19-24 have otherwise been amended to clarify that the plastic structural member is a thermoplastic structural member. This is an inherent property of the polyolefins and thermoplastic polymer that is either coating fibers or has fibers embedded therein, from which the presently claimed polymer blends are formulated. Accordingly, this amendment does not introduce new matter.

For reasons which are submitted below, the claims are believed to be in condition for allowance. The claim amendments and new claims are believed to resolve the concerns raised by the Examiner. Accordingly, reconsideration is respectfully requested.

Turning to the Office Action, Claim 1 was objected to because “flange sections measured perpendicular said horizontal axis” was missing a “to” after “perpendicular” and because the first “to” in “said flange section to is two to ten times the width” should be deleted. Accordingly, Claim 1 has been amended to make these changes. Withdrawal by the Examiner of this objection is therefore respectfully requested.

Next, Claims 1 – 4, 6 – 8 and 17 – 24 were rejected under 35 U.S.C. §103(a) as obvious in view of the combined teachings of Nosker et al., U.S. Patent No. 5,789,477 in view of Marinelli et al., U.S. Patent No. 5,789,477. The Examiner considered the presently claimed structural members to be the polymer blends of Nosker et al. molded into the shape of the Marinelli et al. articles. This rejection is respectfully traversed in view of the above claim amendments for the reasons set forth hereinafter.

Marinelli et al. discloses high density polyethylene and rubber composite railroad ties that cannot handle high loads without deforming. The co-continuous immiscible polymer blend of the present invention will easily handle loads or greater than 600 psi without deforming, while the HDPE and rubber composite of Marinelli et al. will deform with loads less than 200 psi. The Marinelli et al. railroad ties lack the required stiffness for use as structural members. High density polyethylene has a modulus of elasticity of approximately 160k, while rubber has a modulus of elasticity of only about 50k. Thus, the addition of the rubber to the HDPE, as disclosed in Marinelli et al. further reduces the modulus of elasticity of the blend.

The present invention, on the other hand, utilizes a composite which is composed of a high density polyolefin component, such as high density polyethylene with a thermoplastic polymer-coated fiber component which, in the preferred embodiment utilizes polypropylene as the thermoplastic polymer. The blending of the polypropylene coated fibers with the high density polyethylene raises the modulus of elasticity of the blend to above 200k.

Because of the lack of stiffness, the railroad tie in Marinelli et al. is unsuitable for use as a structural member, despite the fact that its cross-sectional area is more rectangular than the cross-sectional area of the presently claimed structural members. Shaping the Marinelli et al. composite material like the structural members presently claimed only further reduces the cross-sectional

area and makes it all the more unsuitable for use as a structural member.

The presently claimed blend of a high density polyolefin and a thermoplastic polymer-coated fiber material or a thermoplastic polymer having fiber material embedded therein makes possible the fabrication of load-bearing structural members with the claimed web and flange dimensions. Claim 1 has been amended to emphasize this distinction and thereby patentably defines over the cited combination of Nosker et al. and Marinelli et al..

By amending Claim 1 in this manner this rejection of Claims 1-4, 6-8 and 17-24 under 35 U.S.C. §103(a) as obvious in view of Nosker et al. and Marinelli et al. has been overcome. Reconsideration by the Examiner and withdrawal of this rejection is respectfully requested.

**CONCLUSION**

In view of the above claim amendments and the foregoing remarks, this application is now in condition for allowance. Reconsideration is respectfully requested. However, in the event any issues remain outstanding, the Examiner is requested to telephone the undersigned at the below-listed telephone number so that their resolution may be discussed.

Finally, if there are any additional charges in connection with this response, the Examiner is authorized to charge Applicant's deposit account number 50-1943 therefor.

Respectfully submitted,

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